REPORT UPON EPIDEMIC CHOLERA AS IT APPEARED AT JONESBOROUGH, TENN.

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THE disease appeared in Greeneville, Tenn., a town situated on the line of the East Tennessee, Virginia, and Georgia Railroad, twenty-five miles west of Jonesborough, between the 18th and 20th June. Many cases were of a malignant character, the patients dying within a few hours after they were attacked.

Some four or five weeks elapsed from the time of its departure from Greeneville, before it assumed an epidemic form in Jonesborough. During this period quite a number of cases occurred in the intervening country, some of which were of a very malignant character. Two cases, both of which were refugees from Greeneville, occurred here some days prior to its actual development as an epidemic. One of these was of a violent type, the other was mild — both recovered. The first case among our resident population was the wife of a gentleman who had waited constantly at the bedside of the first mentioned case from Greeneville, in the capacity of nurse. The houses were a quarter of a mile apart. Those who believe the disease to be contagious impute the attack to the poison conveyed in the clothing of the husband. No other case occurred after that date (July 13), until the 24th of that month, when it, at once, assumed an epidemic form. The period marked by the greatest fatality was from 29th July to August 1, inclusive of both dates.

The disease almost uniformly was preceded by a painless diarrhœa,[1] passing rapidly into rice-water discharges, cramping of the voluntary muscles, coolness of breath with extreme coldness of tongue, capillary congestion of face, nose, ears, and extremities, with total suppression of the functions of liver and kidneys.

No regard seemed to be paid to locality or surroundings. Residences on elevated points and those in the valleys were, alike, subject to the visitations of this pestilence.

The same sort of disregard was manifested to localities, whether clean or filthy. The town was thoroughly policed a month or more beforehand. Every privy, public and private, was either thoroughly renovated or disinfected. Old pits were filled up with fresh earth, when practicable, and new ones dug. Lime, chloride of lime, sulphate of iron, carbolic acid, etc., were freely used. The disease, notwithstanding all this, was of an exceedingly

[1] An exception to this occurred in the person of a negro man belonging to the grave-digging force. Cramps preceded the diarrhœa, as reported to me by his associates. He died in about four hours after the attack.

malignant type; some of the patients who were of a naturally robust constitution died in from four to eight hours after the attack. It appeared alike indifferent to habits of personal cleanliness or filth. The discharges — ejections and dejections — of patients were always, at once, removed from the sick room and carefully covered with earth. Disinfectants also of almost every kind were diligently and liberally employed in the sick room and about the bed.

The major part of our population trusted to the "strength of their legs," and sought safety by flight. A few, but very few, were attacked in their places of retreat. After we had formed a theory more satisfactory to us at least than the opinions of authors, the remaining population was placed on muriated tincture of iron, — ten to twelve drops, morning, noon, and evening. It is not remembered that a single individual of those left behind who used this prescription was attacked; but returning refugees did not appear to enjoy a like immunity. Three individuals, all females, were attacked within a day or two after their return to town. They had, however, employed the preventive means rather carelessly and irregularly. Their cases yielded promptly to the remedy hereinafter mentioned.

Some four or five gravel train hands were attacked with the malignant form of the disease. Our hotels were closed. The inmates of our county jail were not attacked until some time after the first appearance of the disease among us. The jailer, who had labored under hemiplegia for perhaps twelve months, died. A colored female prisoner was subsequently attacked, but her case was of a rather mild type.

Observations and Results. — Diligent observation of the symptoms presented by a large number of well-developed cases of cholera, has fully satisfied me that the disease is *toxæmia*, or blood-poisoning. My reasons for this diagnosis are substantially as follows: The usual indications of the initial stage are diarrhœa and vomiting, the former rapidly assuming the character of rice-water discharges, composed, in a large measure, it is universally admitted, of a portion of the constituent elements of the blood.

The mental lethargy, physical prostration, depression of vital energies, and the suppressed functions of the liver and kidneys, are but the results of toxical influence acting primarily on the blood; and are such effects as might reasonably be apprehended from the introduction of a poison into the circulation. The symptoms characteristic of uræmia and pyemia are not, I conceive, more distinctly suggestive of blood-poisoning than are the general features of a well-developed case of cholera. Diarrhœa, although present in a large majority of cases, is not an essential feature of the disease. Many instances occur in which the prostration of the vital energies bears no sort of relation to the frequency or amount of such discharges.

Deaths have occurred ten or twelve hours after all discharges had ceased, notwithstanding every effort at stimulation and alimentation; the general symptoms meanwhile exhibiting, no less conspicuously, the depressing effects of a powerful poison.

The uniform effect of remedies of acknowledged depurative and disinfectant virtues has been, in nearly every instance, the relief of vital organs, and

the restoration of their functions. The litmus test applied to the ejections and dejections revealed the highly alkaline condition of both. These facts indicated not more distinctly the real character of this malady, so fearfully destructive of human life, than the agent which, in some one or more of its combinations, would prove the effective remedy, namely, *chlorine.*

The patient first selected, on whom to try the virtues of the remedy, was a "nymph du pave" who had been pulseless for several hours. Chlorate of potassa was employed hypodermically, and prescribed internally in doses of one and a half grains every hour. At the end of twenty-four hours she was still alive. She was next placed on muriated tincture of iron, in doses of ten drops every hour. She was found still living at the end of another twenty-four hours. We next employed solution perchloride ferri. No observable advantage was realized. She died in the evening of the third day, having been totally destitute of pulse for more than sixty hours.

Finally, the writer would briefly state his conclusions, as follows: —

(1.) The belief that cholera is of a special zymotic origin, as expressed in his report, is not entertained by him to the exclusion of the possibility that it also has atmospheric relations in its causation. In the latter case, however, the morbific agent seems to exist in the exhalations from the lungs, as well as those from the discharges from the stomach and bowels; and the medium through which it enters the circulation is, perhaps invariably, the lungs. The peculiar or specific poison is believed to belong to that class defined by Liebig as capable of *reproduction.*

(2.) The established power of chlorine as a disinfectant and the recognized virtues of its compounds, as hydrochloric acid, chloride of sodium, chlorate of potassa, muriated tincture of iron, bichloride of mercury, etc., appear to give additional strength to the theory.

The muriated tincture of iron was found to be in nearly every instance — perhaps all — where it was regularly employed, a thorough preventive. The presence of this, or of any other acid, in the discharges from the stomach and bowels was disproved by the litmus test.

(3.) *Hydrochloric acid is believed to be deficient in quality or altogether absent in every case of cholera whether of atmospheric or of zymotic origin.* The preventive and curative virtues of its compounds furnish arguments *a priori* and *a posteriori*, which the writer commends to the consideration of the members of the Public Health Association as well as of the profession generally.